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SUICIDES IN ACTIVE-DUTY ENLISTED NAVY PERSONNEL

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SUMMARY

Problem

Although studies of suicides among Navy personnel have been conducted in the past, the research has not been as consistent or as comprehensive as the biennial surveys of suicide among Army personnel conducted by the Division of Neuropsychiatry at Walter Reed Army Institute of Research. A comparable program of research among Navy personnel would help to resolve some major issues. For instance, studies of the incidence of completed suicide and destructive behavior in the Navy have been limited by the lack of comprehensive data on population at risk.

Objective

The two objectives in this paper were first, to identify potential demographic and service-related risk factors associated with completed suicides among enlisted Navy personnel during a 12-year period, 1974 to 1985, and, second, to examine the severity of rates of completed suicide in the U.S. Navy relative to similar rates in the United States general population and determine the extent to which patterns of completed suicide in the two populations were similar to, or different from, one another.

Keywords: SUICIDE, NAVY PERSONNEL, Potential Demographic risk, Service-related Risk, Psychiatry • (JG)

Approach
Cases of completed suicide among U.S. Navy enlisted personnel occurring during 1 January 1974 to 31 December 1985 were identified from a computerized Enlisted Service History File edited and maintained by the Naval Health Research Center (NHRC) in San Diego, California. The case selection criteria were the presence of both a code of 952 (died) in the last event and a code of 890 (suicide) in the Department of Defense Loss Code. The Enlisted Service History File also was utilized to calculate the person years at risk during the study period for all active-duty enlisted personnel. Age-specific and age-adjusted mortality rates were calculated for the study population (5,657.150 person years). Data for the total United States were obtained from the Statistical Abstracts of the United States. Variables analyzed in this study included age, sex, race, occupation, and year died. Occupational classifications were grouped into five categories based on similarity of assigned tasks and work environment.

Results

During the years 1974 through 1985, there was a total of 373 confirmed suicides for an average of 32 cases per year based on the criteria described above. The suicide rate was 6.59 per 100,000 person-years. Even though 80 percent of suicides were under the age of 30 years, no consistent association between age and suicide was observed. The Navy suicide rates were lower than in the

U.S., but, from 1977 to 1983, the Navy suicide rates in the 17 to 24 age group have been showing a trend toward increasing while the U.S. rates appear to be stabilizing or even slightly decreasing. Female suicide rates are significantly lower (50%) than that found in males. The rates of white suicides tended to be higher than for nonwhites, but the differences were not significant. In the U.S. population, whites have a significantly higher suicide rate than blacks. Age-related suicide risk among men in the Navy and in the U.S. population appear to differ by race. Only four of the 109 specific occupations in the Navy were significantly higher than expected after age-adjusted rates were computed.

Conclusion

Although the Navy suicide rates are significantly lower than in the U.S. population, there is an upward trend in Navy suicides in the 17 to 34 age group which is greater than that found in the U.S. in the same age group from 1976 to 1983. Such an upward trend in the Navy could not be attributed to the Navy drawing from a high risk age group in the civilian population since the civilian rates have levelled off or declined. Army suicide rates have been in steady decline since 1975. The implications are that the increases found in the Navy over a similar period cannot be due to a military-wide set of circumstances. The female rates of suicide in the Navy are significantly lower than males, so it may be speculated that the Navy offers a positive and protected environment for the women that choose to enlist. The occupational analysis indicates that there are few if any jobs at high risk for suicide.

Recommendation

Since increases in suicide may be peculiar to the Navy, ongoing studies would be recommended to track the validity of such increases in the present and toward the future for the Navy. Health care providers in the Navy may want to remain alerted to suicide as possibly an increasing problem for which prevention and treatment programs should be considered. Since for every one suicide there are as many as eight to 20 suicide attempts, the Navy should realize the potentially tremendous hidden costs to an increasing suicide rate. The U.S. Public Health Service in 1980 embraced suicide prevention as a key public health strategy. By 1985, the Secretary of the Department of Health and Human Services formed a task force on youth suicide chaired by the Director of the National Institute of Mental Health. The federal programs appear to be making headway. Since the Navy rate of suicide may be still increasing, despite federal trends and Army trends to the contrary, stronger health care programs directed towards suicide prevention following the U.S. Department of Health and Human Services model should be implemented in the Navy.

SUICIDES IN ACTIVE-DUTY ENLISTED NAVY PERSONNEL

Traditionally, the rates of self-inflicted deaths among active-duty U.S. military personnel have been lower than the rates among their civilian counterparts (Chaffee, 1982; Datel & Johnson, 1979; Rothberg, Rock, Shaw & Jones, 1988). This has been attributed to a number of factors, including the uniform availability of medical and psychiatric care (Palinkas, 1985), the "healthy worker effect" (Burr & Palinkas, 1988), the formal and informal mechanisms for screening of personnel (Datel & Johnson, 1979; Grigg, 1988; Rock, 1988), and the organizational culture of the military (Hayes & Johnson, 1979). Nevertheless, the problem of suicides among active-duty Navy personnel demands serious attention for a number of reasons. First, completed suicide is the third leading cause of death among 17-24 year olds in the U.S. and in the military, surpassed only by accidents and homicide (Pfeffer, 1985; McGinnis, 1987; Redman, 1985; U.S. Department of Health and Human Services, 1985).

Second, suicide rates among 20 to 24 year olds in the U.S. are increasing (Petzel & Cline, 1978). This age group in the U.S. population provides the primary source of manpower for the Navy. Preliminary data suggest that the incidence of completed suicides among active-duty Navy personnel has increased over the past few years (Palinkas & Coben, n.d.).

Third, psychiatric and behavior disorders which, in some instances, are predictors of suicidal behavior are the second leading cause of hospital admissions among Navy personnel (Gunderson, Looney & Goffman, 1975; Palinkas, Balazs & Coben, 1987). Disorders such as substance abuse, personality disorders, and affective disorders have been linked to an increased risk of completed suicides (Berglund, 1984; Clayton, 1985; Roy, 1982).

Fourth, suicidal behavior compromises the effectiveness of the Navy. Hospitalization and outpatient treatment of personnel making suicide attempts or gestures represent days,

weeks, and even months of noneffectiveness. Loss of personnel due to deaths or medical discharges represent a loss in terms of training time and expense (Chaffee, 1982). In addition, the loss of individual potential and the impact on family and friends is immeasurable.

The effect of a suicide gesture, attempt or completion on unit morale needs further study. The relatively low rate of suicide among Navy personnel obscures the severe impact such an event has on other members of the victim's command. This impact is a product of the organizational system in which the event occurs. Such events serve to magnify for co-workers their own sources of stress, both occupational and personal, and may even result in one or more "imitative" suicides as suggested in a recent investigation of Navy recruits (Grigg, 1988). It may be also perceived by co-workers as evidence of the inability of the Navy to take care of its own, even though the cause of death may be unrelated to military performance and occupational stress. In such instances, other members of the command may be considered victims of the suicidal act.

Finally, suicidal behavior in the Navy demands serious attention because it may be a preventable condition. It has been suggested that the risk of suicidal gestures, attempts and completions may be reduced through screening (Hoiberg & Garfein, 1976; Gaines & Richmond, 1980), awareness of warning signs (Grigg, 1988; Coben & Palinkas, 1988), and adoption of stress management programs (Grigg, 1988; Meichenbaum, 1985).

Although studies of suicides among Navy personnel have been conducted in the past (Chaffee, 1982; Palinkas, 1985; Chaffee & Coben 1983; Spaulding & Edwards, 1975; Schuckit & Gunderson, 1974), this research has not been as consistent or as comprehensive as the biennial surveys of suicide among Army personnel conducted by the Division of Neuropsychiatry at Walter Reed Army Institute of Research (Datel & Johnson, 1979; Rothberg, Rock, Shaw & Jones, 1988; Datel, Jones & Esposito, 1981; Datel & Jones, 1982; Rothberg,

Rock & Jones, 1984; Rothberg & Jones, 1987). A comparable program of research among Navy personnel would help to resolve some major issues. For instance, studies of the incidence of completed suicide and destructive behavior in the Navy have been limited by the lack of comprehensive data on population at risk.

The present study was conducted with two specific objectives in mind. The first was to identify potential demographic and service-related risk factors associated with completed suicides among enlisted Navy personnel during a 12-year period, 1974 to 1985. The second objective was to examine the severity of rates of completed suicide in the U.S. Navy relative to similar rates in the United States general population and determine the extent to which patterns of completed suicide in the two populations were similar to or different from one another.

METHODS

Cases of completed suicide among U.S. Navy enlisted personnel occurring during 1 January 1974 to 31 December 1985 were identified from a computerized Enlisted Service History File edited and maintained by the Naval Health Research Center (NHRC) in San Diego, California (Garland, Helmkamp, Gunderson, Gorham, Miller, McNally, & Thompson, 1987). The case selection criteria were the presence of both a code of 952 (died) in the last event and a code of 890 (suicide) in the Department of Defense Loss Code. Only two-thirds of the suicides (890) had death records (952), reducing the cases significantly. A similar discrepancy in numbers of cases of completed suicide was reported by Dennett (1988). Nevertheless, both codes were included as selection factors to obtain the most complete information on confirmed suicides.

The Enlisted Service History File also was utilized to calculate the person years at risk during the study period for all active-duty enlisted personnel. Age-specific and age-adjusted mortality rates were calculated for the study population (5,657,150 person years). Age-adjustment was done using the indirect method, based on suicide rates of the total active-duty enlisted population or total United States white and black males (17-54 years of age), depending on the comparisons being made. Data for the total United States were obtained from the Statistical Abstracts of the United States (source of abstracts: United States National Center for Health Statistics, Vital Statistics of the United States, annual). Ninety-five percent confidence intervals (95 percent CI) were calculated assuming a Poisson distribution (Lilienfeld & Lilienfeld, 1980).

Variables analyzed in this study included age, sex, race, occupation, and year died. Occupational classifications were grouped into five categories based on similarity of assigned tasks and work environment (Coben and Palinkas, 1988).

RESULTS

The number of active-duty enlisted personnel in the U.S. Navy during the years 1974 through 1985 averaged 471,429. During this period, there was an annual average of 32 confirmed cases of suicides based on the criteria described above. The mortality rate for completed suicide during the 12-year study period was 6.59 per 100,000 person-years.

The incidence of completed suicide by year roughly resembles a U-shaped curve with the highest rates occurring at the beginning and end of the 12-year period (Table 1). A steady increase in mortality rate was observed between 1976 and 1983. The decline in rates in 1984 and 1985 may be attributed to the delay in official declarations of suicide as the cause of death due to the length of time involved in investigations of the events.

TABLE 1 - Suicide rates by year for active-duty enlisted Navy personnel, 1974-1985.

Year	Person-years at risk	Number of cases	Incidence rates per 100,000	95 percent conf limits
1974	476633	41	8.60	6.17 - 11.67
1975	466724	36	7.71	5.40 - 10.68
1976	458162	16	3.49	2.00 - 5.67
1977	454709	24	5.28	3.38 - 7.86
1978	457257	21	4.59	2.84 - 7.02
1979	456021	26	5.70	3.73 - 8.35
1980	457260	29	6.34	4.25 - 9.11
1981	466816	28	6.00	4.00 - 8.67
1982	475859	31	6.52	4.43 - 9.25
1983	490496	47	9.58	7.04 - 12.75
1984	496849	37	7.45	5.24 - 10.27
1985	500364	37	7.40	5.21 - 10.19
Total	*5657150	373	6.59	5.74 - 7.30

*Totals subject to slight rounding errors.

Age-specific rates of completed suicide for all active-duty enlisted Navy personnel are presented in Table 2. Approximately 80 percent of this population is under the age of 30 years. Most of the completed suicides occurred in the 20-24 year old group; however, no consistent association between age and mortality was observed.

TABLE 2 - Age-specific suicide rates for total active-duty enlisted Navy personnel, 1974-1985.

Age	Person-years at risk	Number of cases	Incidence rate per 100,000	95 percent conf limits
17-19	908688	53	5.84	4.37 - 7.63
20-24	2450006	168	6.86	5.86 - 7.98
25-29	1014048	75	7.40	5.82 - 9.27
30-34	622280	40	6.43	4.59 - 8.75
35-39	466382	26	5.58	3.64 - 8.17
40-44	148746	7	4.71	1.89 - 9.70
45-49	38994	3	7.69	1.59 - 22.48
50-54	8013	1	12.48	0.32 - 69.52
Total	5657157	373	6.59	5.74 - 7.30

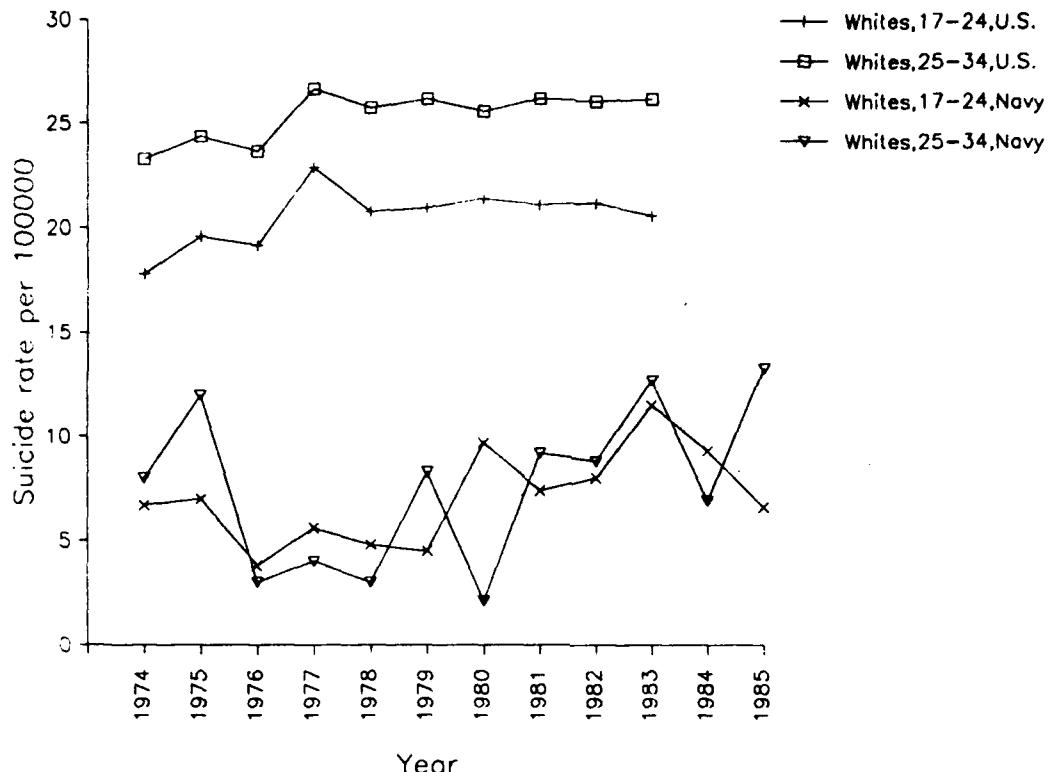


Figure 1 - Age-adjusted suicide rates for age groups by year for U.S. and Navy white males.

A year by year comparison between white males, 17 to 24 and 25 to 34 years of age in active-duty enlisted Navy personnel and in the United States is shown in Figure 1. The age groups were compared since they are, by far, the most numerous in active-duty enlisted Navy personnel, and any trend, especially if divergent from the U.S. data (Statistical Abstracts of the United States), should be scrutinized carefully and remedial action considered. The Navy suicide rates were lower than in the U.S., but, between the years 1976 and 1983, the Navy suicide rates have been showing a trend toward increasing. For the age groups 17-24 and 25-34 combined the age specific rates per 100,000 for the years 1976 to 1983 are 3.6, 5.1, 4.3, 5.6, 7.4, 8.0, 8.3 and 11.9. The linear trend for these data is clear and significant ($r=.94$,

p<.01). The U.S. rates, for the same years, appear to be relatively stable in the 17 to 24 year old age group.

An age adjusted suicide rate comparison between male and female active-duty enlisted Navy personnel is shown in Table 3. The data shows that the female suicide rate is one-half that found in males which is a statistically significant difference.

TABLE 3 - Age-adjusted rates of suicides for males and females, active-duty enlisted Navy personnel.

Gender	Person-years at risk	Number of cases	Incidence rate per 100,000	95 percent conf limits
Males	5285681	362	6.85	6.17 - 7.60
Females	335693	11	3.20	1.59 - 5.72
Total	5621374	373	6.63	

Table 4 shows the age-adjusted rates of suicide by racial group, for males only. Females were not included in the analysis because of their small number. For racial groups, the "other" designation includes mostly males of Asian and Pacific islander ancestry with the Philippines being the most common country of origin. The rates of white suicides were in the direction of being higher than for nonwhites, but the differences were not significant.

TABLE 4 - Age-adjusted rates of suicides by race groups, active-duty enlisted Navy men¹.

Race	Person-years at risk	Number of cases	Incidence rates per 100,000	95 percent conf limits
White	4387098	319	7.26	6.48 - 8.09
Black	553069	28	5.00	3.33 - 7.24
Other	345514	15	4.42	3.16 - 7.30
Total	5285681	362	6.82	

¹Female cases: nine white, one black, and one "other."

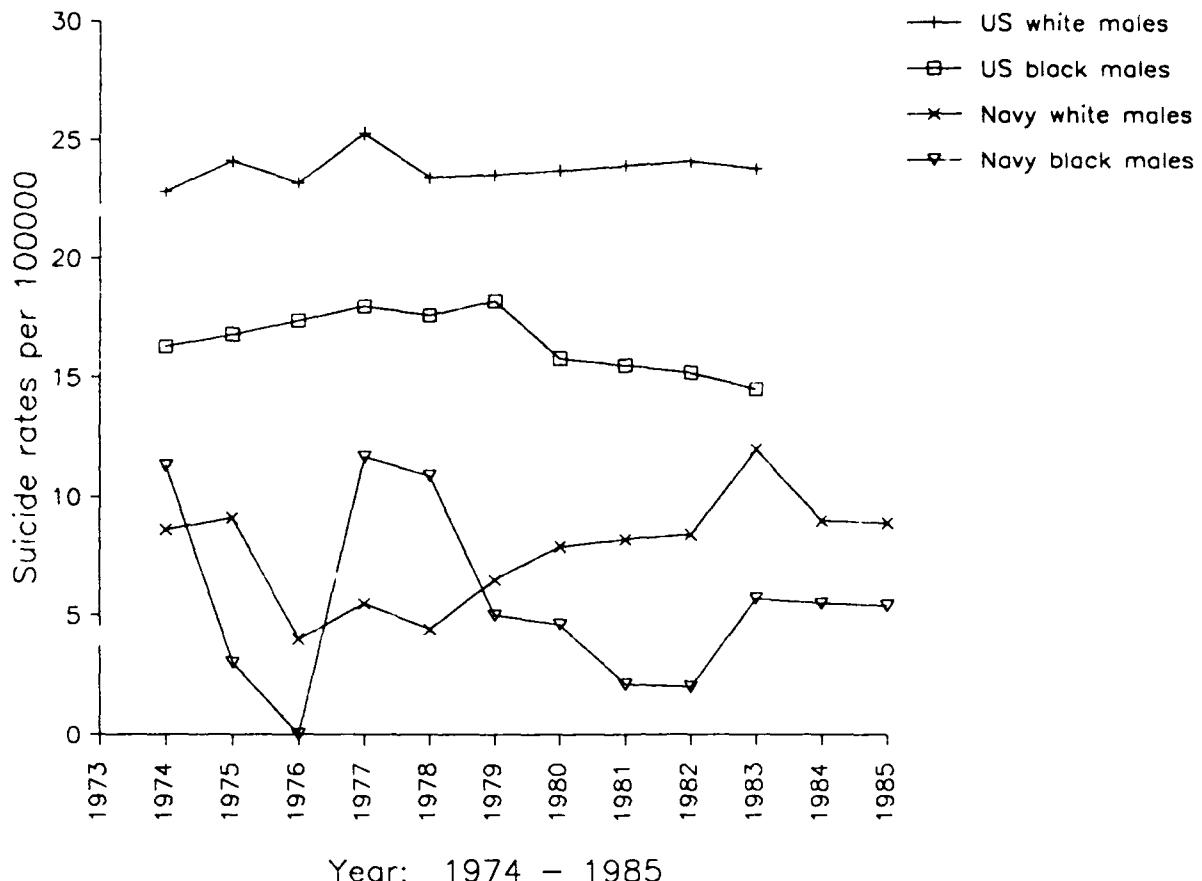


Figure 2 - U.S. and Navy, age-adjusted male suicide rates by year, 1974 to 1985. The Navy suicides are based on active-duty enlisted personnel.

Data for white and black males, 17 to 54 years old in the U.S., were collected (Statistical Abstracts of the United States) and compared with active-duty enlisted Navy white and black males, 17 to 54 years old. Figure 2 shows the age-adjusted suicide rates by year. The standard population used for age adjustment was white and black males in the U.S. for the years 1974 to 1983, which represented the most recent data for suicides available in the Statistical Abstracts of the United States. It can be seen that Navy suicide rates are clearly lower than in the U.S., and blacks have a consistently lower suicide rate than whites in the U.S. population but not in the Navy.

Figure 3 shows age-specific suicide rates for age groups for white and black males in the U.S. and the Navy. There is a relatively high peak of suicide rates for the 25 to 34 age groups for all white and black, U.S. and Navy groups. For both military and civilian white males, the highest suicide rate occurred at the oldest age group, 45 to 54. Among blacks, however, suicide rates appear to decline after age 34. Age-related suicide risk among men in the Navy and in the U.S. population in general, therefore, appear to differ by race.

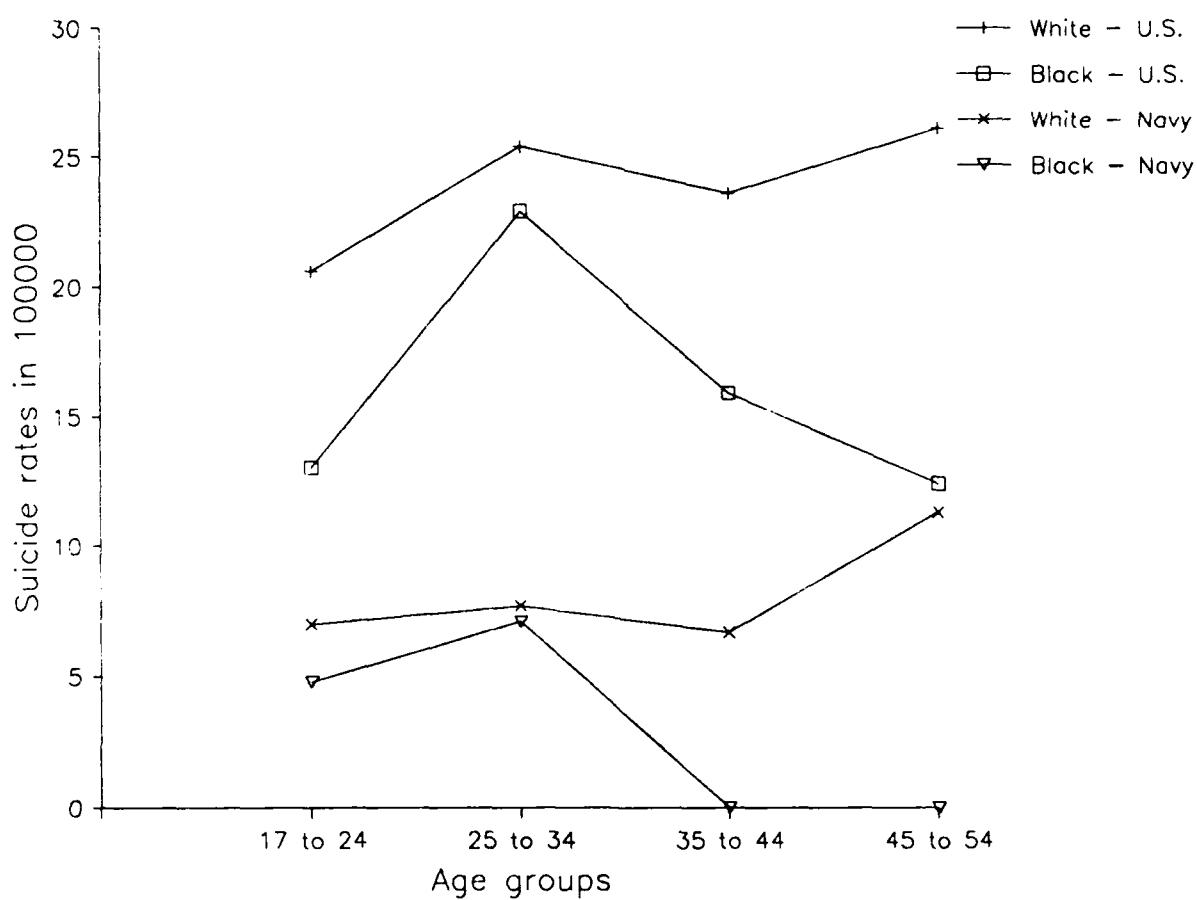


Figure 3 - Suicide rates for age groups for white and black males in the United States and Navy.

Age-adjusted suicide rates (Navy males and females) for five groupings of specific occupations (Navy rates) are shown in Table 5. Three rate groups, administrative/clerical, electronic/technical, and medical, had lower suicide rates than the apprentice/recruits and blue collar rate groups, but there were no significant differences.

If Navy females are not included, then age adjusted suicide rates for Navy males show that the electronic/technical grouping is significantly lower than the other groupings. Since the data represented in Figure 3 suggested an age related difference in suicide risk between white and black males, a separate age-adjusted suicide rate was calculated for white and black males. There were no significant differences in the five rate groupings within whites and blacks.

In the appendix are specific occupations that are significantly different or tended in that direction. The specific occupations are listed by rate groupings or occupational areas. Several specific occupations were specialties within an occupational area (aviation machinist's mate, aviation support equipment technician, gunner's mate, electronics technician, and sonar technician), so they were analyzed as specific occupations and also grouped together as occupational areas.

The 109 specific occupations that went into making up the five rate groups and their age-adjusted rates are presented in the appendix after the above material. Only four of the 109 specific occupations in the Navy were significantly higher than expected after age-adjusted rates were computed (construction mechanic, gas turbine system technician, quartermaster, and ships serviceman).

TABLE 5 - Age-adjusted rates of suicides for occupational (rate) groups, active-duty enlisted Navy personnel.

Rate	Person-years at risk	Number of cases	Incidence rates per 100,000	95 percent conf limits	
Apprentice/ Recruit	1191632	87	7.49	6.00	9.25
Blue Collar	2087694	158	7.50	6.37	8.76
Admnstrvve/ Clerical	836633	45	5.40	3.94	7.23
Electronic/ Technical	1219224	64	5.18	3.99	6.62
Medical	321974	18	5.50	3.26	8.69
Total	5657157	372	6.57		

DISCUSSION

Overall, it appears that the Navy rate of suicide is lower than the rate in the total U.S. population. The number of Navy suicides between 1974 to 1985 seems to approximate a U-shaped curve. From 1976 to 1983, there is a significant increase in suicides in the 17 to 34 age group. The suicide rates in 1984 and 1985 are lower than in 1983 and may only reflect a delay in completing the suicide reports. In comparing these data with the results of other Navy suicide studies (Chaffee & Coben, 1983; Coben & Palinkas, 1988), it is clear that using both the suicide cause code (890) for reason for loss from the service and the records of death (952) to obtain the present data led to relatively low estimates of suicides. The Chaffee and Coben report (1983) was also abstracted from the computerized medical history files but was based solely on the DOD Loss code 890 (suicide). The Palinkas and Coben (personal communication) data are based on the most current Report of Casualty, DD 1300, prepared by the Navy Military Personnel Command, some of which have not been entered into the computerized medical data base. The conclusions presented in this paper were based on the

analysis of suicides obtained from both the medical (DOD Loss code), and enlisted history portions (death records), of the computerized Enlisted/Career History files and resulted in a low estimate (if a person did not have both records they were not selected as part of the sample). Of course, the suicide data for the United States seem to be significantly low, also. When medical examiners were surveyed, the majority felt that the reported number of suicides in the U.S. were possibly less than half of the actual number (Jobes, Berman, & Josselsen, 1986; McGinnis, 1987). Rock (1988) reports a similar level of incompleteness in the Army suicide data. Therefore, the low estimates in the current study, while apparently quite significant and cause for caution, should not be cause for entirely dismissing the trends described.

In analyzing white males in the Navy in the 17 to 34 age group, there was a significant upward trend in suicides over the years 1976 to 1983. Research from U.S. data indicates that such has been, in decades past, the pattern on a national basis. McGinnis (1987) analyzed data from the U.S. Department of Health and Human Services (1985) and concluded that "since 1950, the suicide rate for young Americans - between age 15 and 24 - virtually tripled, although the rate has declined somewhat in recent years." Data from the Statistical Abstract of the United States (annual) also show such a trend resulting in a peak in 1977 with a leveling off or a slight decline thereafter (figure 1). Interestingly, the upward trend noted in the Navy samples of 17 to 24 and 25 to 34 years of age are greater than that in the U.S. sample in the same age groups from 1977 to 1983. Such an upward trend in the Navy, therefore, could not be attributed to the Navy drawing from a high risk age group in the civilian population since the civilian rates have levelled off or declined. The upward trend in the Navy, relative to the civilian rates, may be due to a number of factors, including an increase in occupation-related stressors, a decline in selective recruiting from the high risk

group of young white males, attention devoted to mental health needs of its personnel, or a combination of such factors. A possible factor is that there may be an increasingly stressful environment in military organizations, in general. If the same upward trend is found in the U.S. Army, then such a possibility would be confirmed.

• Suicide research for U.S. Army personnel (Rothberg & Jones, 1987; Rock, 1988; Rothberg et al., 1988), indicates that Army suicide rates have been in steady decline since 1975. "In 1975-1976 the annual crude suicide rate was 16.4; in 1977-1978 it was 14.8; in 1979-1980 it was 11.6; in 1981-1982 (with late reports) it was 11.4; and in 1983-1984 it was 10.00 (Rothberg et al., 1988)." The implications are that the increases found in the Navy over a similar period cannot be due to a military-wide set of circumstances. The increases in suicide may be peculiar to the Navy. The decline in Army suicides was hypothesized to be due to a decline in the ratio of white soldiers to black soldiers. In 1975-1976 it was 3.7:1; in 1983-1984, it was 2.3:1. White soldiers have a higher suicide rate than black soldiers, but there are fewer white soldiers, therefore, a resulting decline in suicide rate. Such hypothesizing would not apply to the apparent increase in Navy suicide rate. Similar to the Army, the Navy ratio of white to black enlisted personnel has been declining from 10.7:1 in 1975-1976 to 6.5:1 in 1983-1984.

• The evidence for the apparent increasing rate of suicide in the Navy indicates that it does not reflect what is happening in the civilian population, and it does not reflect what is happening in another military organization, the Army. Since the increase may be peculiar to the Navy organization, ongoing studies would be recommended to track the validity of such increases in the present and toward the future for the Navy. Health care providers in the Navy may want to remain alerted to suicide as possibly an increasing problem for which prevention and treatment programs should be considered. The magnitude of the problem

represented by completed suicides is estimated by Davidson and Rokay (1986) that for every one suicide, there are as many as eight to 20 suicide attempts. Therefore, the number of personnel with whom health care providers must be concerned may not be the hundreds analyzed in this report but may mount into the tens of thousands including the unreported suicide completions and suicide attempts.

There were significantly lower rates of female suicides than male in the Navy. In the Army suicide studies (Rothberg & Jones, 1987; Rock, 1988; Rothberg et al., 1988), the female suicide rates have been similar to males and have followed the same declining pattern (15.2 in 1977-1978, 9.9 in 1983-1984). The Army studies speculate that "efforts to improve the status of women in the Army played a role in this reduction but we lack data to test this hypothesis (Rothberg et al., 1988)."

Significance was not reached when assessing race group differences. The relative risk for white male suicides over black male suicides was approximately 1.5. For the Army (Rothberg, et al., 1988), the relative risk for white male suicides over black male suicides is higher, at 2.3. In the U.S. (Statistical Abstracts of the United States), the relative risk for white versus black male suicides between 17 and 54 years of age was approximately 1.6.

When white and black suicide rates for the U.S. and the Navy were assessed by age groups, the Navy suicide rates were lower. There seemed to be differences in the pattern of suicide rates relative to age group; that is the oldest, the 45 to 54 age group, increased for U.S. and Navy whites and did not increase for U.S. and Navy blacks. One speculation might be that whatever biopsychosocial factors influences increased suicide rates in older white males operates in both the U.S. and the Navy.

The occupational analysis indicates that there are few if any jobs at high risk for suicide. Only four occupational rates, construction mechanic, gas turbine system-technician,

quartermaster, and ships serviceman, had significantly high suicide rates relative to the total Navy suicide rate. Given the large number of Navy occupational rates of 115, a significantly high suicide rate in four occupational rates could be expected on the basis of chance alone given the significance level ($p=.05$) used.

Male suicide rates for the occupational rate groupings showed that the electronic/technical grouping was significantly lower than the other groupings. White, black, and "other" (mostly asian american) male suicide rates for the rate groupings showed no significant differences.

As stated above, the concern with suicide in the Navy may be a growing one. Many consider suicide in the U.S. to be the leading cause of unnecessary, preventable, and stigmatizing death (Seiden, 1981; McGinnis, 1987). The U.S. Public Health Service in 1980 "embraced suicide prevention as a key public health strategy (McGinnis, 1987)." Some of the objectives selected as federal priorities include having more than 60% of young adults being able to identify an accessible suicide prevention "hotline," the number of persons reached by mutual support or self-help groups should double from 1978 figures, the majority of adults should be able to identify an appropriate community agency to assist in coping with a stressful situation (McGinnis, 1987). By 1985, the Secretary of the Department of Health and Human Services formed a task force on youth suicide chaired by the Director of the National Institute of Mental Health. The task force was to work at the federal, state, and local levels to assess and disseminate information on suicide prevention and to help develop programs which can effectively tackle the problem of suicide (McGinnis, 1987). Data collected by the Public Health Service since 1978 indicate that the suicide rates in young adults in the U.S. have stabilized or declined slightly. The federal program therefore appears to be making headway. Since the Navy rate of suicide may be still increasing, despite federal trends and Army trends

to the contrary, stronger health care programs directed towards suicide prevention following the U.S. Department of Health and Human Services model should be considered in the Navy.

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APPENDIX

Specific occupations that were significantly different in their suicide rates from expected, or tended in that direction, are listed by rate group. The numbers of suicides, the age adjusted rate, and the 95 percent confidence limits are shown in the parentheses. Any age adjusted rate which is significant is marked with an asterisk.

Apprentice/recruits - none.

Blue collar - aviation electrician's mate (11, 12.72, 6.35-22.76), aviation machinist's mate (11, 10.75, 5.36-19.24), aviation machinist's mate-jet engines (4, 12.96, 3.52-33.08), aviation support equipment technician (2, 36.65, 4.44-132.41), aviation support equipment technician-mechanical (2, 20.28, 2.46-73.28), boiler technician (14, 11.28, 6.17-18.92), construction mechanic (5, 28.84*, 9.36-67.32), gas turbine system-technician (1, 293.04*, 9.98-2189.38), gas turbine system-mechanical (1, 13.96, 0.36-77.73), hull maintenance technician (14, 11.28, 6.17-18.93).

Administrative/clerical - quartermaster (5, 52.49*, 17.04-122.51), ships serviceman (9, 16.00*, 7.31-30.37).

Electrical/technical - radioman (4, 2.21*, 0.60-5.65).

Medical - none.

Note: radioman was the only specific occupation that has significantly lower suicides than expected after age adjusted rates were computed.

Specific occupational specialties were grouped into occupational areas, and the occupational areas were analyzed. The following is a listing of the occupational areas with the specific occupations that comprise them. The number of suicides, the age adjusted rates and 95 percent confidence limits for the occupational areas are in the parentheses.

Aviation machinist's mate - aviation machinist's mate, aviation machinist's mate-jet engines, aviation machinist's mate-reciprocating engines - (15, 10.52, 5.88-17.36).

Aviation support equipment technician - aviation support equipment technician, aviation support equipment technician-electrical, aviation support equipment technician-hydraulics/structures, aviation support equipment technician-mechanical - (4, 16.01, 4.36-41.00).

Gunner's mate - gunner's mate, gunner's mate-guns, gunner's mate-missiles, gunner's mate-technician - (7, 8.86, 3.57-18.27).

Electronics technician - electronics technician, electronics technician-communications, electronics technician-radar - (15, 7.91, 4.43-13.06)

Sonar technician - sonar technician, sonar technician-submarine, sonar technician-surface - (6, 7.86, 2.89-17.10).

Appendix

Grp #	Title	Obs	Age	edl	95% C.L.
1	Airman Recruit, AN Apprentice, Airman	17	7.72	4.49	12.36
1	Construction Recruit, Constructionman, Apprentice	0			
1	Fireman Recruit, FN Apprentice, Fireman	19	8.85	5.32	13.82
1	Seaman Recruit, SN Apprentice, Seaman	51	8.11	6.04	10.66
2	Aircraft Maintenance Technician	0			
2	Aircrew Survival Equipmentman	0			
2	Aviation Boatswain's Mate	0			
2	Aviation Boatswain's Mate-Aircraft Handling	2	8.45	.78	23.30
2	Aviation Boatswain's Mate-Fuels	1	5.87	.15	32.69
2	Aviation Boatswain's Mate-Launch/Recovery	0			
2	Aviation Electrician's Mate	11	12.72	6.35	22.76
2	Aviation Fire Control Technician	1	2.84	.07	15.82
2	Aviation Machinist's Mate	11	10.75	5.36	19.24
2	Aviation Machinist's Mate-Jet Engines	4	12.92	3.52	33.08
2	Aviation Machinist's Mate-Reciprocating Engines	0			
2	Aviation Maintenance Administrationman	3	8.51	1.75	24.88
2	Aviation Ordnanceman	4	6.25	1.70	16.00
2	Aviation Structural Mechanic	0			
2	Aviation Structural Mechanic-Hydraulics	5	8.06	2.62	18.81
2	Aviation Structural Mechanic-Safety Equipment	1	3.45	.09	19.21
2	Aviation Structural Mechanic-Structures	5	6.14	2.00	14.33
2	Aviation Support Equipment Technician	2	36.85	4.44	132.41
2	Aviation Support Equipment Technician-Electrical	0			
2	Aviation Support Equipment Technician-Hydraulics/Structures	0			
2	Aviation Support Equipment Technician-Mechanical	2	20.28	2.46	73.28
2	Avionics Technician	0			
2	Boatswain's Mate	6	6.02	2.21	13.10
2	Boiler Technician	14	11.28	6.17	18.92
2	Boilermaker	0			
2	Builder	2	6.59	.80	23.81
2	Construction Electrician	2	12.77	1.55	48.14
2	Construction Mechanic	5	28.94	9.36	87.32
2	Constructionman	0			
2	Electrician's Mate	14	9.89	5.41	16.80
2	Engineering Aid	0			
2	Engineman	9	9.58	4.38	18.18
2	Equipment Operator	0			
2	Equipmentman	0			
2	Gas Turbine System Technician	1	393.04	9.98	2189.36

Grp #	Title	Obs	Age	edl	95% C.L.
2	Gas turbine system-electrician	0			
2	Gas turbine system-mechanical	1	13.98	36	77.73
2	Gunner's Mate	0			
2	Gunner's Mate-Guns	2	4.6	56	16.63
2	Gunner's Mate-Missiles	3	20.38	4.20	59.55
2	Gunner's Mate-Technician	2	10.43	1.27	37.68
2	Hull Maintenance Technician	14	11.28	6.17	18.93
2	Interiors Communications Electrician	3	4.88	1.00	14.24
2	Machinery Repairman	0			
2	Machinist's Mate	19	6.71	4.04	10.48
2	Mineman	0			
2	Missile Technician	0			
2	Molder	0			
2	Ocean systems Tech-Analyst	0			
2	Ocean systems Tech-Maintenance	0			
2	Ocean Systems Technician	0			
2	Patternmaker	0			
2	Steelworker	1	9.55	.24	53.17
2	Torpedoman's Mate	5	11.23	3.64	26.20
2	Utilitiesman	1	6.54	.16	36.42
3		1	10		
3	Aviation Storekeeper	2	4.35	.53	15.71
3	Commissaryman (obsolete)	0	10.1	.26	56.23
3	Data Processing Technician	2	5.04	.61	18.22
3	Disbursing Clerk	3	11.41	2.35	33.35
3	Intelligence Specialist	0			
3	Journalist	0			
3	Legalman	0			
3	Mess Management Specialist	9	5.45	2.48	10.35
3	Navy Counselor	0			
3	Personnelman	3	3.76	.78	10.98
3	Postal Clerk	2	15.85	1.92	57.27
3	Quartermaster	5	52.49	17.04	122.51
3	Ships Serviceman	9	16	7.31	30.37
3	Storekeeper	7	6.82	2.75	14.06
3	Yeoman	9	7.15	3.27	13.56
3	Yeoman-Communications	0			
4		0			
4	Aerographer's Mate	0			

#1=Appr/rcr, 2=Blue coll, 3=Adm ctr, 4=Etc/tec, 5=Med, *=Paulicdes.

Appendix

Grp #	Title	Obs.	Age sd	95% C.L.
4	Air Controlman	1	3.46	.09 - 19.29
4	Antisubmarine Warfare Technician	1	4.64	.12 - 25.85
4	Aviation ASW Operator (Acoustic/Non-acoustic)	2	6.06	.73 - 21.89
4	Aviation Electronics Technician	11	9.44	4.71 - 16.88
4	Cryptologic Technician	0		
4	Cryptologic Technician-Administrative	0		
4	Cryptologic Technician-Collections	1	4.68	.13 - 27.20
4	Cryptologic Technician-Communications	1	5.03	.13 - 28.03
4	Cryptologic Technician-Interpretive	0		
4	Cryptologic Technician-Maintenance	0		
4	Cryptologic Technician-Technical	0		
4	Data Systems Technician	0		
4	Electronics Technician	10	7.89	3.78 - 14.50
4	Electronics Technician-Communications	4	10.6	2.69 - 27.15
4	Electronics Technician-Radar	1	3.13	.08 - 17.60
4	Electronics Warfare Technician	1	4.68	.12 - 26.06
4	Fire Control Technician	0		
4	Fire Control Technician-Ballistic Missile	0		
4	Fire Control Technician-Gun	2	5.01	.61 - 18.10
4	Fire Control Technician-Surface Missile	2	5.61	.68 - 20.29
4	Illustrator Draftsman	1	24.73	.63 - 137.74
4	Instrumentman	1	20.25	.51 - 112.81
4	Lithographer	0		
4	Master-at-arms	0		
4	Musician	0		
4	Operations Specialist	8	8.85	3.82 - 17.44
4	Opticalman	0		
4	Photographer's Mate	1	4.31	.11 - 24.01
4	Precision Instrumentman	0		
4	Radioman	4	2.21	.60 - 5.65
4	Signalman	2	6.18	.74 - 22.23
4	Sonar Technician	0		
4	Sonar Technician-Submarine	5	17.51	5.69 - 40.87
4	Sonar Technician-Surface	1	2.19	.05 - 12.23
4	Tradezman	0		
5	Dental Recruit, Dentalman, Dental Technician, Apprent.	1	2.61	.07 - 14.54
5	Hospital Recruit, Hospitalman, Hospital Corpsman, Apprent.	17	6.58	3.84 - 10.54

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